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(54) **METHODS OF TREATING CELLULITE**

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(58) **Field of Classification Search**

None

See application file for complete search history.

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(57) **ABSTRACT**

Provided are methods of treating cellulite, the methods comprising applying to skin in need of cellulite treatment a composition comprising paulownin or an extract of *Paulownia* wood.

17 Claims, No Drawings

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METHODS OF TREATING CELLULITE

CROSS-REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of U.S. application Ser. No. 12/859,323, filed Aug. 19, 2010, now abandoned the entire disclosure of which is incorporated by reference herein.

FIELD OF INVENTION

The present invention relates to methods of treating cellulite. More specifically, it relates to methods of treating cellulite comprising applying paulownin and/or extracts of *Paulownia* to the skin.

DESCRIPTION OF RELATED ART

Lipodystrophy is an alteration of the appearance of the skin surface resulting from the protrusion of adipose lobules through unstretchable conjunctive tissue. This condition, often referred to as "cellulite," is a common problem experienced by women, starting as early as puberty. It is distinct from obesity and concerns mainly the abdomen, thighs and buttocks. Long before any clinical manifestation, cellulite begins with the accumulation of triglyceride in the subcutaneous adipocytes, effecting increased volume of the subcutaneous fat layer, mechanical stress and tension in the skin, and eventually depressions on the skin surface. These depressions, sometimes referred to as an "orange peel" effect, results in a padded, uneven, and often unattractive appearance of the skin.

Paulownia is a genus of plants native to Asia which has spread gradually to Europe and the USA. In Japan, *Paulownia* is called kiri which refers specifically to one species, *Paulownia tomentosa*, also called "Princess Tree." Other names which are commonly used are "empress tree," "Foxglove Tree," "Royal *Paulownia*," "Pao tong" (in China) and "Odong-Namoo" (in Korea). The scientific name is "*Paulownia tomentosa*" with a number of synonyms reported in various literature, i.e., "*Paulownia imperialis,*" "*Paulownia recurva,*" and "*Bignonia tomentosa.*" *Paulownia tomentosa* belongs to the family "Paulowniaceae" sometimes referred to "Scrophulariaceae." The United States Department of Agriculture (plants.USDA.gov) Plant database identifies Princess tree by a unique symbol "PATO2," with *Paulownia tomentosa* and *Paulownia imperialis* as synonym names.

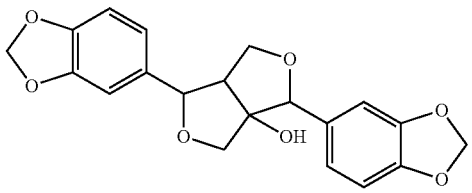
The flower oil of *Paulownia tomentosa* is well studied and found to be richer in aroma as compared to other species. A number of bioactivities are associated with extracts of various parts of *Paulownia*, e.g., anti-cancer components from flower extract, anthelminthic activity from non-specified extract, antibacterial activities from fruit and flower extracts, antioxidant activity from flower extract, and anti-viral properties from stem bark. Leaf extracts of *Paulownia* are described for hair growth and hair promoting properties.

Paulownia fortunei also belongs to the family "Paulowniaceae." The flower, leaf, skin, root and fruit of *Paulownia fortunei* are of medical value and are reported for use in treating infections, inflammation and injury, in anti-tumor creams. The bark is reported for use in treating orthopaedic disease, hemorrhoids, and foot odor and the epicarp of the fruit for antimicrobial activity. The leaves are reported for use in dissolving pyogenic infection and promoting hair growth.

Paulownia tomentosa and *Paulownia fortunei* are described in Chinese "Compendium of Materia Medica" with

two additional species not specifically identified with their latin names. The reference can be found under Drug 35-11, page 3034, English translation 2003. The medical use of flower, leaf, and bark of *Paulownia* are described in the Compendium of Materia Medica and are reported for use in treating infections, inflammation and injury, in anti-tumor creams (CN101181609A). The bark is reported (*Materia Medica*, Drug 35-11-2, pp 3036, English Translation 2003) for use in treating hemorrhoids and to kill worms. The fruit is described to have antimicrobial activity (Cercos, "Antimicrobial activity of the epicarp of the fruits of *Paulownia fortunei* and *Paulownia tomentosa,*" *Revista Argentina de microbiologia* (1982), 14(2), 111-4). The leaves are reported for use in treating malignant erosion of the genitalia, puffy edema on hands and feet, and falling hair (*Materia Medica*, Drug 35-11). *Paulownia elongta, Paulownia kawakamii* and a hybrid plant *paulownia taiwaniana* are also grown for their wood use.

Paulownin, also known as isopaulownin or neopaulownin, is a lignan isolated from aerial parts of various plants. The chemical structure can be given as follows:



The present invention relates to applicant's discovery that paulownin and/or extracts of *Paulownia* wood are beneficial for use in compositions on skin and tend to exhibit significant and unexpected inhibition of adipogenesis (inhibiting differentiation of human preadipocytes to adipocytes). As such, the inventors have found that paulownin and extracts of *Paulownia* wood are beneficial for topical use of compositions on skin in need of cellulite treatment or the surface manifestation of cellulite treatment.

SUMMARY OF THE INVENTION

The present invention is directed to a method of treating cellulite comprising applying to skin in need of cellulite treatment a composition comprising paulownin or an extract of *Paulownia* wood.

DESCRIPTION OF THE INVENTION

As used herein, the term "cellulite" is synonomous with lipodystrophy, an alteration of the appearance of the skin surface resulting from the protrusion of adipose lobules through unstretchable conjunctive tissue. This condition is distinct from obesity and may be present on the abdomen, thighs and buttocks, and especially the thighs and buttocks.

As used herein, the term "skin in need of skin cellulite treatment" refers generally to skin, particularly skin of the abdomen, thighs, and or buttocks that exhibits a padded and orange-peel appearance generally from the protrusion of adipose lobules through unstretchable conjunctive tissue. According to certain embodiments, skin in need of cellulite treatment includes skin having clinical "Grade 2" cellulite (after skin compression or after muscular contraction there is pallor, decreased temperature and decreased elasticity; no relief alterations at rest; histopathologically, hyperplasia and

hypertrophy of the periadipocyte and pericapillary argentaffin fibril framework occurs along with capillary dilatation, microhaemorrhages and increased thickness of the capillary basement membrane) or higher, as described in A. Beatris et al, *Cellulite: A Review Journal of European Academy of Dermatology and Venerology* 2000, 14, 251-262.

Accordingly, the present compositions and methods are useful for treating both cellulite and the surface manifestation of cellulite (i.e., orange-peel appearance).

As used herein, unless otherwise specified, all percentages of ingredients in compositions are weight percent of active/solids ingredient based on the total weight of composition.

As used herein, a composition that is "essentially free" of an ingredient means the composition that has about 2% or less of that ingredient by weight based on the total weight of the composition. Preferably, a composition that is essentially free of an ingredient has about 1% or less, more preferably about 0.5% or less, more preferably about 0.1% or less, more preferably about 0.05 or less, more preferably about 0.01% or less by weight based on the total weight of composition of the ingredient. In certain more preferred embodiments, a composition that is essentially free of an ingredient is free of the ingredient, i.e. has none of that ingredient in the composition.

As used herein, "cosmetically/dermatologically acceptable" means that the ingredients which the term describes are suitable for use in contact with tissues (e.g., the skin or hair) without undue toxicity, incompatibility, instability, irritation, allergic response, and the like.

Any suitable extracts of *Paulownia* wood, for example the wood of *Paulownia tomentosa, Paulownia fortunei, Paulownia elongate, Paulownia taiwaniana*, and/or *Paulownia kawakamii*, may be used in accord with the present invention. In certain preferred embodiments, the extracts are extracts of the wood of *Paulownia fortunei, Paulownia elongata* and/or *Paulownia kawakamii*. In certain particularly preferred embodiments, the extract is an extract of the wood of *Paulownia tomentosa*. In general, the wood of the *Paulownia* trees include wood from the stem, branches, or a combination of both. Suitable extracts of *Paulownia* wood may be derived from wood chips, wood dusts and/or small cuttings, and the like.

Suitable extracts of *Paulownia* wood may be obtained using conventional methods including, but not limited to, direct extraction of material from the wood by grinding, macerating, pressing, squeezing, mashing, centrifuging, and/or processes such as cold percolation, agitation/distillation, microwave assisted extraction, sonication, supercritical/subcritical CO_2 compressed gas extraction with or without polar modifiers, pressurized solvent extraction, accelerated solvent extraction, pressurized or normal hot water extraction, surfactant assisted pressurized hot water extraction, oil extraction, membrane extraction, Soxhlet extraction, the gold finger distillation/extraction and/or processes disclosed, for example, in U.S. Pat. Nos. 7,442,391, 7,473,435, and 7,537,791 to Integrated Botanical Technologies, LLC, incorporated herein by reference, and the like, or by other methods such as solvent extraction, and the like. Any of a variety of solvents including polar solvents, non-polar solvents, or combinations of two or more thereof may be used in methods of comprising solvent extraction. Suitable polar solvents include polar inorganic solvents such as water and the like, polar organic solvents such as alcohols and corresponding organic acids, for example C_1-C_8 alcohols including methanol, ethanol, propanol, butanol, and the like and organic acids, including acetic acid, formic acid, propanoic acid, and the like, polyols and glycols, including C_1-C_8 polyols/glycols and the like, and combinations of two or more thereof. Suitable non-polar solvents include non-polar organic solvents such as alkanes, including C_1-C_8 alkanes, cycloalkanes, including C_1-C_8 alkanes, alkyl ethers, including C_1-C_8 alkyl ethers, Petroleum ethers, ketones, including C_1-C_8 ketones, methylene chloride, ethyl acetate, xylene, toluene, chloroform, vegetable oil, mineral oil and the like. In another embodiment extraction may be obtained by non-polar solvents described above or supercritical fluid extraction with or without a polar modifier such as C_1-C_8 alcohols, water, C_1-C_8 polyols/glycols or C_1-C_8 organic acids. In certain preferred embodiments, the extract of the invention is a polar extract prepared by pulverizing the wood and extracting using a polar solvent having a dielectric constant value of between 1 and 100 at 20° C., preferably a dielectric constant of a value between 4 and 60 at 20° C., more preferably a dielectric constant of a value between 4 and 50 at 20° C., and even more preferably a dielectric constant of a value between 4 and 40 at 20° C. Examples of preferred polar solvents include C_1-C_8 alcohols, C_1-C_8 polyols/glycols, C_1-C_8 organic acids, water and combinations of two or more thereof having a dielectric constant value of between 1 and 100, preferably between 4 and 60, and more preferably between 5 and 40 at 20° C., including, but not limited to, those solvents and combinations of solvents having the desired dielectric constant value as disclosed in "Dielectric Constants of Some Organic Solvent-Water Mixtures at Various Temperatures," Akerlof, Gosta; *JACS*, Vol. 54, No. 11 (November 1932), pp. 4125-4139, incorporated herein by reference. In certain preferred embodiments, the polar extract is extracted using one or more C_1-C_8 alcohols, C_1-C_8 polyols, C_1-C_8 glycols, and combinations of two or more thereof. In certain more preferred embodiments, the extract is extracted using one or more C_1-C_4 alcohols, C_1-C_4 polyols, and/or C_1-C_4 glycols. In certain more preferred embodiments, the extract is prepared using a solvent comprising methanol, ethanol, or a combination thereof with or without presence of water. In more preferred embodiment, the extract is prepared using anhydrous alcohol or reagent grade denatured alcohol and dried Kiri wood dust agitating at room temperature for 3 days. In certain preferred embodiments, the extract may be further refined by charcoal (also referred to as active carbon) treatment.

In certain embodiments, the extract of *Paulownia* wood may be prepared to be essentially free of certain materials. In one embodiment, the extract is essentially free of Ursolic acid, beta-Sitosterol, or both.

In certain embodiments, the composition may additionally include extracts from other parts of *Paulownia*, for example, one or more of the bark, leaves, roots, fruits, seeds, or flowers. In other embodiments, the composition is essentially free from extracts of other non-wood parts of *Paulownia*.

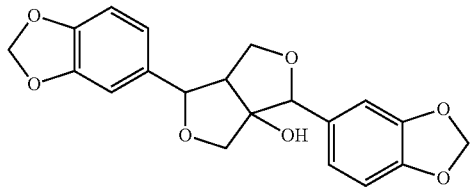
In certain embodiments, the composition may comprise extracts from cell cultures of plants of the genus *Paulownia*, such as *Paulownia tomentosa, Paulownia fortunei, Paulownia elongata*, and/or *Paulownia kawakamii*.

Any suitable amounts of extract of *Paulownia* wood may be used in the compositions of the present invention. Preferably, the compositions comprise a safe and effective amount of *Paulownia* wood extract. As used herein, a "safe and effective amount" means an amount of the extract or of the composition sufficient to induce the desired effect, but low enough to avoid serious side effects, including cytotoxicity and the like. In certain embodiments of the invention, the compositions comprise a "cellulite treating effective amount," which means an amount effective to achieve a Percent Inhibition in the Adipogenesis Inhibition Test as described below. In certain preferred embodiments, the cellulite treating effective amount is an amount effective to achieve a Percent Inhibition

value of about 20% or greater, when tested in the Adipogenesis Inhibition Test described below, in a concentration ranging from 0.1 μg/ml to about 100 μg/ml.

In certain preferred embodiments, the compositions comprise from greater than zero to about 20% extract of *Paulownia* wood. In certain other preferred embodiments, the compositions comprise from about 0.01 to about 10%, from about 0.1 to about 5%, from about 0.1 to about 1%, from about 0.5 to about 5%, or from about 0.5 to about 2% extract of *Paulownia* wood.

Paulownin is a compound of the formula:



Paulownin for use herein may be derived via any of a variety of natural sources, such as extraction from botanicals, or may be synthesized using known synthetic methods (see, for example, Angle et al., "Stereoselective Synthesis of 3-Alkyl-2-aryltetrahydrofuran-4-ols: Total Synthesis of (±)-Paulownin," *Journal of Organic Chemistry* (2008), 73(16), 6268-6278; and Okazaki et al., "Total synthesis of (+)-paulownin,"*Bioscience, Biotechnology, and Biochemistry* (1997), 61(4), 743-745). In certain preferred embodiments, the paulownin is extracted from botanicals. Examples of suitable botanicals include plants of the genus *Paulownia*, such as *Paulownia tomentosa, Paulownia fortunei, Paulownia elongata, Paulownia kawakamii*, as well as other plants such as *Amanoa oblongifolia, Amanoa oblongifolia, Dolichandrone crispa, Firmiana platanifolia, Gmelina arborea, Gmelina asiatica, Gmelina vitiensis, Isodon parvifolius, Kigelia pinnata, Markhamia platycalyx, Markhamia stipulate, Millingtonia hortensis*, botanicals of the species *olea, Phyllarthron comorense, Tabebuia incana, Vitex trifolia, Prasium majus*, combinations of two or more thereof, and the like. In certain preferred embodiments, the paulownin is extracted from the wood of *Paulownia tomentosa, Paulownia fortunei, Paulownia elongata*, and/or *Paulownia kawakamii*.

In certain embodiments, paulownin may be obtained via extraction of cell cultures of various plants, including cell cultures of plants of the genus *Paulownia*, such as *Paulownia tomentosa, Paulownia fortunei, Paulownia elongata*, and/or *Paulownia kawakamii*. The cell cultures which are extracted to obtain extracts/paulownin for use in the present invention may be of any form including suspension cell cultures and the like.

Any suitable amounts of Paulownin may be used in the compositions of the present invention. Preferably, the compositions comprise a safe and effective amount of Paulownin. In certain preferred embodiments, the compositions comprise a cellulite treating effective amount as described infra.

In certain preferred embodiments, the compositions comprise from greater than zero to about 20% Paulownin. In certain other preferred embodiments, the compositions comprise from about 0.01 to about 10%, from about 0.1 to about 5%, from about 0.1 to about 1%, from about 0.5 to about 5%, or from about 0.5 to about 2% Paulownin.

Any suitable carrier may be used in the compositions of the present invention. Preferably, for a skin care composition, the carrier is a cosmetically-acceptable carrier. As will be recognized by those of skill in the art, cosmetically-acceptable carriers comprise carriers that are suitable for use in contact with the body, in particular the skin for skin whitening applications, without undue toxicity, incompatibility, instability, irritation, allergic response, and the like. A safe and effective amount of carrier is from about 50% to about 99.999%, preferably from about 80% to about 99.9%, more preferably from about 99.9% to about 95%, most preferably from about 99.8% to about 98% of the composition. The carrier can be in a wide variety of forms. For example, emulsion carriers, including, but not limited to, oil-in-water, water-in-oil, water-in-oil-in-water, and oil-in-water-in-silicone emulsions, are useful herein. These emulsions can cover a broad range of viscosities, e.g, from about 100 cps to about 200,000 cps. Examples of suitable cosmetically-acceptable carriers include cosmetically-acceptable solvents and materials for cosmetic solutions, suspensions, lotions, creams, serums, essences, gels, toners, sticks, sprays, ointments, liquid washes and soap bars, shampoos, hair conditioners, pastes, foams, mousses, powders, shaving creams, wipes, patches, strips, powered patches, microneedle patches, bandages, hydrogels, film-forming products, facial and skin masks, make-up, liquid drops, and the like. These product types may contain several types of cosmetically-acceptable carriers including, but not limited to solutions, suspensions, emulsions such as microemulsions and nanoemulsions, gels, solids, liposomes, other encapsulation technologies and the like. The following are non-limitative examples of such carriers. Other carriers can be formulated by those of ordinary skill in the art.

In one embodiment, the carrier contains water. In a further embodiment, the carrier may also contain one or more aqueous or organic solvents. Examples of organic solvents include, but are not limited to: dimethyl isosorbide; isopropylmyristate; surfactants of cationic, anionic and nonionic nature; vegetable oils; mineral oils; waxes; gums; synthetic and natural gelling agents; alkanols; glycols; and polyols. Examples of glycols include, but are not limited to, glycerin, propylene glycol, butylene glycol, pentalene glycol, hexylene glycol, polyethylene glycol, polypropylene glycol, diethylene glycol, triethylene glycol, capryl glycol, glycerol, butanediol and hexanetriol, and copolymers or mixtures thereof. Examples of alkanols include, but are not limited to, those having from about 2 carbon atoms to about 12 carbon atoms (e.g., from about 2 carbon atoms to about 4 carbon atoms), such as isopropanol and ethanol. Examples of polyols include, but are not limited to, those having from about 2 carbon atoms to about 15 carbon atoms (e.g., from about 2 carbon atoms to about 10 carbon atoms) such as propylene glycol. The organic solvents may be present in the carrier in an amount, based upon the total weight of the carrier, of from about 1 percent to about 99.99 percent (e.g., from about 20 percent to about 50 percent). Water may be present in the carrier (prior to use) in an amount, based upon the total weight of the carrier, of from about 5 percent to about 95 percent (e.g., from about 50 percent to about 90 percent). Solutions may contain any suitable amounts of solvent, including from about 40 to about 99.99%. Certain preferred solutions contain from about 50 to about 99.9%, from about 60 to about 99%, from about 70 to about 99%, from about 80 to about 99%, or from about 90 to 99%.

A lotion can be made from such a solution. Lotions typically contain at least one emollient in addition to a solvent. Lotions may comprise from about 1% to about 20% (e.g., from about 5% to about 10%) of an emollient(s) and from about 50% to about 90% (e.g., from about 60% to about 80%) of water.

Another type of product that may be formulated from a solution is a cream. A cream typically contains from about 5% to about 50% (e.g., from about 10% to about 20%) of an emollient(s) and from about 45% to about 85% (e.g., from about 50% to about 75%) of water.

Yet another type of product that may be formulated from a solution is an ointment. An ointment may contain a simple base of animal, vegetable, or synthetic oils or semi-solid hydrocarbons. An ointment may contain from about 2% to about 10% of an emollient(s) plus from about 0.1% to about 2% of a thickening agent(s).

The compositions useful in the present invention can also be formulated as emulsions. If the carrier is an emulsion, from about 1% to about 10% (e.g., from about 2% to about 5%) of the carrier contains an emulsifier(s). Emulsifiers may be non-ionic, anionic or cationic.

Lotions and creams can be formulated as emulsions. Typically such lotions contain from 0.5% to about 5% of an emulsifier(s), while such creams would typically contain from about 1% to about 20% (e.g., from about 5% to about 10%) of an emollient(s); from about 20% to about 80% (e.g., from 30% to about 70%) of water; and from about 1% to about 10% (e.g., from about 2% to about 5%) of an emulsifier(s).

Single emulsion skin care preparations, such as lotions and creams, of the oil-in-water type and water-in-oil type are well-known in the art and are useful in the subject invention. Multiphase emulsion compositions, such as the water-in-oil-in-water type or the oil-in-water-in-oil type, are also useful in the subject invention. In general, such single or multiphase emulsions contain water, emollients, and emulsifiers as essential ingredients.

The compositions of this invention can also be formulated as a gel (e.g., an aqueous, alcohol, alcohol/water, or oil gel using a suitable gelling agent(s)). Suitable gelling agents for aqueous and/or alcoholic gels include, but are not limited to, natural gums, acrylic acid and acrylate polymers and copolymers, and cellulose derivatives (e.g., hydroxymethyl cellulose and hydroxypropyl cellulose). Suitable gelling agents for oils (such as mineral oil) include, but are not limited to, hydrogenated butylene/ethylene/styrene copolymer and hydrogenated ethylene/propylene/styrene copolymer. Such gels typically contains between about 0.1% and 5%, by weight, of such gelling agents.

The compositions of the present invention can also be formulated into a solid formulation (e.g., a wax-based stick, soap bar composition, powder, or wipe). The composition of the present invention can also be combined with a solid, semi-solid or dissolvable substrate (eg., a wipe, mask, pad, glove or strip).

The compositions of the present invention can also be formulated into formulation used for the oral cavity, such as toothpaste, gel, rinse, solution, patch, and the like. The compositions may also be formulated for use in the eye, such as in solutions, emulsions, suspensions used as drops or washes and the like, or formulated for use in the vaginal mucosa such as via gels, lotions, lubricants, and the like.

The compositions of the present invention may further comprise any of a variety of additional cosmetically active agents. Examples of suitable additional active agents include: additional anti-adipogenesis agents, lipolytic agents, lymphatic draining agents, darkening agents, additional anti-aging agents, tropoelastin promoters, tropoelastin crosslinkers, collagen promoters, anti-acne agents, shine control agents, anti-microbial agents such as anti-yeast agents, anti-fungal, and anti-bacterial agents, anti-inflammatory agents, anti-parasite agents, external analgesics, sunscreens, photoprotectors, antioxidants, keratolytic agents, detergents/surfactants, moisturizers, nutrients, vitamins, energy enhancers, anti-perspiration agents, astringents, deodorants, hair removers, hair growth enhancing agents, hair growth delaying agents, firming agents, hydration boosters, efficacy boosters, anti-callous agents, agents for skin conditioning skin-lightening agents, fluorides, odor-control agents such as odor masking or pH-changing agents, and the like. Examples of various suitable additional cosmetically acceptable actives include hydroxy acids, benzoyl peroxide, D-panthenol, UV filters such as but not limited to avobenzone (Parsol 1789), bisdisulizole disodium (Neo Heliopan AP), diethylamino hydroxybenzoyl hexyl benzoate (Uvinul A Plus), ecamsule (Mexoryl SX), methyl anthranilate, 4-aminobenzoic acid (PABA), cinoxate, ethylhexyl triazone (Uvinul T 150), homosalate, 4-methylbenzylidene camphor (Parsol 5000), octyl methoxycinnamate (Octinoxate), octyl salicylate (Octisalate), padimate O (Escalol 507), phenylbenzimidazole sulfonic acid (Ensulizole), polysilicone-15 (Parsol SLX), trolamine salicylate, Bemotrizinol (Tinosorb S), benzophenones 1-12, dioxybenzone, drometrizole trisiloxane (Mexoryl XL), iscotrizinol (Uvasorb HEB), octocrylene, oxybenzone (Eusolex 4360), sulisobenzone, bisoctrizole (Tinosorb M), titanium dioxide, zinc oxide, carotenoids, free radical scavengers, retinoids and retinoid precursors such as retinol, retinoic acid and retinyl palmitate, ceramides, polyunsaturated fatty acids, essential fatty acids, enzymes, enzyme inhibitors, minerals, hormones such as estrogens, steroids such as hydrocortisone, 2-dimethylaminoethanol, copper salts such as copper chloride, peptides containing copper such as Cu:Gly-His-Lys, coenzyme Q10, amino acids such a proline, vitamins, lactobionic acid, acetyl-coenzyme A, niacin, riboflavin, thiamin, ribose, electron transporters such as NADH and FADH2, and other botanical extracts such as oat, aloe vera, Feverfew, Soy, Shiitake mushroom extracts, and derivatives and mixtures thereof.

Particularly preferred cosmetically active agents include additional anti-adipogenesis agents (especially retinoids such as retinol), lipolytic agents (especially caffeine or forskolin), and additional anti-aging agents, such as collagen promoters and tropoelastin promoters (especially blackberry leaf extract), tropoelastin crosslinkers (especially dill extract), and lymphatic draining agents (especially ruscus extract, aesculin (aesculus hippocastanus extract) and combinations thereof.

In certain preferred embodiments, the compositions of the present invention are skin care compositions that comprise paulownin or an extract of *Paulownia* wood and at least one additional anti-adipogenesis agent. Examples of suitable additional anti-adipogenesis agents include, but are not limited to, retinoids such as retinols.

In certain preferred embodiments, the compositions of the present invention are skin care compositions that comprise paulownin or an extract of *Paulownia* wood and a lipolytic agent. Lipolytic agents breakdown lipids and involves the hydrolysis of triglycerides into free fatty acids. Examples of lipolytic agents include caffeine (1,3,7-trimethyl-1H-purine-2,6(3H,7H)-dione3,7-dihydro-1,3,7-trimethyl-1H-purine-2,6-dione), forskolin ((3R,4aR,5S,6S,6aS,10S,10aR,10bS)-6,10,10b-trihydroxy-3,4-a,7,7,10a-pentamethyl-1-oxo-3-vinyldodecahydro-1H-benzo[f]chromen-5-yl acetate, a labdane diterpene that is produced by the Indian Coleus plant) or yohimbin (17α-hydroxy-yohimban-16α-carboxylic acid methyl ester, an alkaloid an alkaloid found naturally in *Pausinystalia yohimbe*), and hormones such as epinephrine, norepinephrine, glucagon, growth hormone, testosterone, and cortisol.

Examples of suitable tyrosinase inhibitors include but, are not limited to, Vitamin C and its derivatives, Vitamin E and its derivatives, Kojic Acid, Arbutin, resorcinols, hydroquinone, Flavones e.g. Licorice flavanoids, Licorice root extract, Mulberry root extract, *Dioscorea Coposita* root extract, *Saxifraga* extract and the like, Ellagic acid, Salicylates and derivatives, Glucosamine and derivatives, Fullerene, Hinokitiol, Dioic acid, Acetyl glucosamine, 5,5'-dipropyl-biphenyl-2,2'-diol (Magnolignan), 4-(4-hydroxyphenyl)-2-butanol (4-HPB), combinations of two or more thereof, and the like. Examples of vitamin C derivatives include, but are not limited to, ascorbic acid and salts, Ascorbic Acid-2-Glucoside, sodium ascorbyl phosphate, magnesium ascorbyl phosphate, and natural extract enriched in vitamin C. Examples of vitamin E derivatives include, but are not limited to, alpha-tocopherol, beta, tocopherol, gamma-tocopherol, delta-tocopherol, alpha-tocotrienol, beta-tocotrienol, gamma-tocotrienol, delta-tocotrienol and mixtures thereof, tocopherol acetate, tocopherol phosphate and natural extracts enriched in vitamin E derivatives. Examples of resorcinol derivatives include, but are not limited to, resorcinol, 4-substituted resorcinols like 4-alkylresorcinols such as 4-butyresorcinol (rucinol), 4-hexylresorcinol (Synovea HR, Sytheon), phenylethyl resorcinol (Symwhite, Symrise), 1-(2,4-dihydroxyphenyl)-3-(2,4-dimethoxy-3-methylphenyl)-Propane (nivitol, Unigen) and the like and natural extracts enriched in resorcinols. Examples of salicylates include, but are not limited to, 4-methoxy potassium salicylate, salicylic acid, acetylsalicylic acid, 4-methoxysalicylic acid and their salts. In certain preferred embodiments, the tyrosinase inhibitors include a 4-substituted resorcinol, a vitamin C derivative, or a vitamin E derivative. In more preferred embodiments, the tyrosinase inhibitor comprises Phenylethyl resorcinol, 4-hexyl resorcinol, or ascorbyl-2-glucoside.

Examples of suitable melanin-degradation agents include, but are not limited to, peroxides and enzymes such as peroxidases and ligninases. In certain preferred embodiments, the melanin-inhibiting agents include a peroxide or a ligninase.

Examples of suitable melanosome transfer inhibiting agents including PAR-2 antagonists such as soy trypsin inhibitor or Bowman-Birk Inhibitor, Vitamin B3 and derivatives such as Niacinamide, Essential soy, Whole Soy, Soy extract. In certain preferred embodiments, the melanosome transfer inhibiting agents includes a soy extract or niacinamide.

Examples of exfolliants include, but are not limited to, alpha-hydroxy acids such as lactic acid, glycolic acid, malic acid, tartaric acid, citric acid, or any combination of any of the foregoing, beta-hydroxy acids such as salicylic acid, polyhydroxy acids such as lactobionic acid and gluconic acid, and mechanical exfoliation such as microdermabrasion. In certain preferred embodiments, the exfolliant include glycolic acid or salicylic acid.

Examples of sunscreens include, but are not limited to, avobenzone (Parsol 1789), bisdisulizole disodium (Neo Heliopan AP), diethylamino hydroxybenzoyl hexyl benzoate (Uvinul A Plus), ecamsule (Mexoryl SX), methyl anthranilate, 4-aminobenzoic acid (PABA), cinoxate, ethylhexyl triazone (Uvinul T 150), homosalate, 4-methylbenzylidene camphor (Parsol 5000), octyl methoxycinnamate (Octinoxate), octyl salicylate (Octisalate), padimate O (Escalol 507), phenylbenzimidazole sulfonic acid (Ensulizole), polysilicone-15 (Parsol SLX), trolamine salicylate, Bemotrizinol (Tinosorb S), benzophenones 1-12, dioxybenzone, drometrizole trisiloxane (Mexoryl XL), iscotrizinol (Uvasorb HEB), octocrylene, oxybenzone (Eusolex 4360), sulisobenzone, bisoctrizole (Tinosorb M), titanium dioxide, zinc oxide, and the like.

Examples of retinoids include, but are not limited to, retinol (Vitamin A alcohol), retinal (Vitamin A aldehyde), retinyl acetate, retinyl propionate, retinyl linoleate, retinoic acid, retinyl palmitate, isotretinoin, tazarotene, bexarotene, Adapalene, combinations of two or more thereof and the like. In certain preferred embodiments, the retinoid is selected from the group consisting of retinol, retinal, retinyl acetate, retinyl propionate, retinyl linoleate, and combinations of two or more thereof. In certain more preferred embodiments, the retinoid is retinol.

Examples of antioxidants include, but are not limited to, water-soluble antioxidants such as sulfhydryl compounds and their derivatives (e.g., sodium metabisulfite and N-acetylcysteine, glutathione), lipoic acid and dihydrolipoic acid, stilbenoids such as resveratrol and derivatives, lactoferrin, iron and copper chelators and ascorbic acid and ascorbic acid derivatives (e.g., ascobyl-2-glucoside, ascorbyl palmitate and ascorbyl polypeptide). Oil-soluble antioxidants suitable for use in the compositions of this invention include, but are not limited to, butylated hydroxytoluene, retinoids (e.g., retinol and retinyl palmitate), tocopherols (e.g., tocopherol acetate), tocotrienols, and ubiquinones. Natural extracts containing antioxidants suitable for use in the compositions of this invention, include, but not limited to, extracts containing flavonoids and isoflavonoids and their derivatives (e.g., genistein and diadzein), extracts containing resveratrol and the like. Examples of such natural extracts include grape seed, green tea, black tea, white tea, pine bark, feverfew, parthenolide-free feverfew, oat extracts, blackberry extract, cotinus extract, soy extract, pomelo extract, wheat germ extract, Hesperedin, Grape extract, *Portulaca* extract, Licochalcone, chalcone, 2,2'-dihydroxy chalcone, *Primula* extract, propolis, and the like.

Lymphatic draining agents are agents that when applied topically can improve lymphatic drainage and include *ruscus* extract, ruscogenin, esculetin and aesculin (*aesculus hippocastanus* extract).

The additional cosmetically active agent may be present in a composition in any suitable amount, for example, in an amount of from about 0.0001% to about 20% by weight of the composition, e.g., about 0.001% to about 10% such as about 0.01% to about 5%. In certain preferred embodiments, in an amount of 0.1% to 5% and in other preferred embodiments from 1% to 2%.

In certain preferred embodiments, the compositions of the present invention are skin care compositions that comprise paulownin or an extract of *Paulownia* wood and at least one additional anti-inflammatory agent. Suitable additional anti-inflammatory active agents include, but are not limited to, compounds that have an IC50 (concentration at which a compound achieves 50% inhibition of inflammation) of less than or equal to 100 μg/ml for Interleukin-2 in the ANTI-INFLAMMATORY ASSAY set forth below. In a preferred embodiment, the IC50 for the second anti-inflammatory compounds is less than about 70 μg/ml, more preferably less than about 50 μg/ml, more preferably less than about 40 μg/ml, more preferably less than about 30 μg/ml.

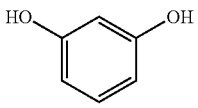
The ANTI-INFLAMMATORY ASSAY assesses the ability of an agent to reduce the production of cytokines by human lymphocytes stimulated with the T-cell receptor (TCR) activating agent phytohaemagglutinin (PHA), and is conducted in the following manner. Human leukocytes are collected from a healthy adult male via leukopheresis, and adjusted to a density of 1×10^6 cells/mL in serum free lym-

phocyte growth medium (ExVivo-15, Biowhittaker, Walkersville, Md.). PBLs are stimulated with 10 μg/mL PHA in the presence or absence of test samples following published methods (Hamamoto Y., et al. *Exp Dermatol* 2:231-235, 1993). Following a 48 hour incubation at 37° C. with 5% CO_2, the supernatant is removed and evaluated for cytokine content using commercially available multiplex cytokine detection kit.

Examples of suitable anti-inflammatory agents include substituted resorcinols, (E)-3-(4-methylphenylsulfonyl)-2-propenenitrile (such as "Bay 11-7082," commercially available from Sigma-Aldrich of St. Louis, Mo.), tetrahydrocurcuminoids (such as Tetrahydrocurcuminoid CG, available from Sabinsa Corporation of Piscataway, N.J.), extracts and materials derived from the following:

Phellodendron Amurense Cortex Extract (PCE)
Non-Denatured Soy (*Glycine max*)
Feverfew (*Tanacetum parthenium*)
Ginger (*Zingiber officinale*)
Ginko (*Ginko Biloba*)
Madecassoside (*centella asiatica* extract ingredient)
Cotinus (*Cotinus coggygria*)
Butterbur Extract (*Petasites hybridus*)
Goji Berry (*Lycium barbarum*)
Milk Thistle Extract (*Silybum marianum*))
Honeysuckle (*Lonicera japonica*)
Basalm of Peru (*Myroxylon pereirae*)
Sage (*Salvia officinalis*)
Cranberry Extract (*Vaccinium oxycoccos*)
Amaranth Oil (*Amaranthus cruentus*)
Pomegranate (*Punica granatum*)
Yerbe Mate (*Ilex paraguariensis* Leaf Extract)
White Lily Flower Extract (*Lilium Candidum*)
Olive Leaf Extract (*Olea europaea*)
Phloretin (apple extract)
Oat Flour (*Aveena Sativa*)
Lifenol (Hops: *Humulus lupulus*) Extract
Bugrane P (*Ononis spinosa*)
Licochalcone (Licorice: *Glycyrrhiza inflate* extract ingredient)
Symrelief (Bisabolol and Ginger extract)
combinations of two or more thereof, and the like.

Resorcinol is a dihydroxy phenol compound (i.e., 1,3 dihydroxybenzene) having by the following structure:

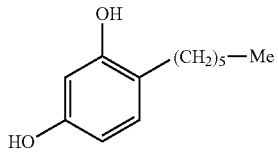


As used herein, "substituted resorcinol" means resorcinol comprising at least one substituent in the 2, 4, 5, or 6 position. Thus, the substituted resorcinol may have as few as one and as many as four substituents. Positions 1 and 3 of the substituted resorcinol comprise —OH groups, as shown above.

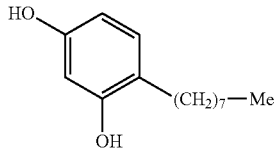
In embodiments wherein substituted resorcinol is used for anti-inflammation, it is highly preferred that all of the substituents of the substituted resorcinol are free of phenyl (—C_6H_5 aromatic) moieties. In certain embodiments, all of the substituents are free of aromatic moieties (with or without heteroatoms). In certain such embodiments, it is preferred that all of the substituents of the substituted resorcinol are free of ketone functionalities (carbonyls bonded to two other carbon atoms). In certain other such embodiments, all of the substituents of the substituted resorcinol are free of both phenyl functionalities and ketone functionalities. In certain other such embodiments, the substituted resorcinol comprises at least one substituent comprising 5 to 11 carbon atoms, preferably 5 to 10 carbon atoms, more preferably 5 to 9 carbon atoms, most preferably 5 to 8 carbon atoms. In certain other such embodiments, at least one substituent comprises an alkyl group, such as one having the number of carbon atoms described above. The alkyl group is preferably unsaturated.

In certain embodiments, the 4 position of the resorcinol is substituted, and, in certain embodiments, only the 4 position is substituted. In another embodiment, the 4 position is substituted with an alkyl group. In certain preferred embodiments, the substituted resorcinol comprises a single substituent at the 4 position that comprises an alkyl group. In certain other preferred embodiments, the substituted resorcinol comprises a single substituent at the 4 position that consists of an alkyl group directly bonded to the benzene ring.

Particularly suitable substituted resorcinols for anti-inflammation agents include 4-hexyl resorcinol and 4-octylresorcinol, particularly 4-hexyl resorcinol. The structures of 4-hexylresorcinol and 4-octylresorcinol are shown below:



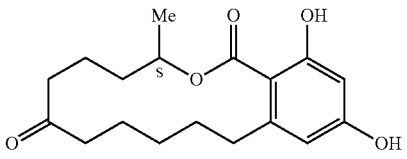
4 hexyl resorcinol



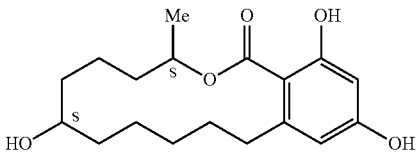
4-octylresorcinol

4-Hexyl resorcinol is commercially available as "SYNOVEA HR" from Sytheon of Lincoln Park, N.J. 4-Octylresorcinol is commercially available from City Chemical LLC of West Haven, Conn.

In certain embodiments, the substituted resorcinol comprises at least two substituents in the 2, 4, 5, or 6 positions. Such substituents may optionally be linked to form a ring, such as a cyclic aliphatic hydrocarbon optionally comprising heteroatoms such as sulfur or oxygen. Such a linked substituent may comprise 5 to 10 carbon atoms, e.g., 8 to 10 carbon atoms, and optionally include 1 to 3 heteroatoms. Examples of suitable substituted resorcinols comprising cyclic aliphatic substituents joining the 2 and 3 positions include Zearalanone and β-Zearalanol:



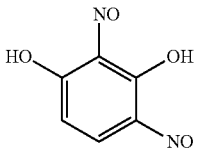
Zearalanone



β-Zearalanol

Zearalanone and β-Zearalanol are commercially available from Sigma Chemicals of St. Louis, Mo.

In certain other embodiments, the substituted resorcinol comprises halide-containing and/or nitroso-containing substituents. Suitable examples contain —Cl or —N═O bonded directly to the benzene ring. These substituents may exist for example in the 2 and 4, 2 and 6, or 4 and 6 positions. An example of a dihalide-substituted resorcinol is 2,6-dichlororesorcinol. An example of a dinitroso-substituted resorcinol is 2,4-dinitrososorcinol:



2,4-dinitrososorcinol

2,6-Dichlororesorcinol and 2,4-Dinitrososorcinol are available from City Chemical LLC of West Haven, Conn.

Substituted resorcinols are prepared by means known in the art, for example, using techniques described in U.S. Pat. No. 4,337,370, the contents of which are incorporated herein by reference.

The substituted resorcinols may have any suitable molecular weight. In certain embodiments, the molecular weight of the substituted resorcinol ranges between about 175 and about 300.

By "extracts of feverfew," it is meant extracts of the plant "*Tanacetum parthenium,*" such as may be produced according to the details set for the in US Patent Application Publication No. 2007/0196523, entitled "PARTHENOLIDE FREE BIOACTIVE INGREDIENTS FROM FEVERFEW (*TANACETUM PARTHENIUM*) AND PROCESSES FOR THEIR PRODUCTION." One particularly suitable feverfew extract is commercially available as about 20% active feverfew, from Integrated Botanical Technologies of Ossining, N.Y.

Compositions of the present invention may include a cosmetically effective amount of one or more additional anti-inflammatory compounds. The compositions preferably include, on an active basis, from about 0.1% to about 10%, more preferably from about 0.5% to about 5%, of the additional anti-inflammatory compound.

In the inventive composition, the ratio of the concentrations of paulownin or extract of *Paulownia* wood to the additional anti-inflammatory compound may be varied. For example, the paulownin or extract of *Paulownia* wood and the anti-inflammatory compound may be present in a concentration by weight ratio (which is determined by dividing the concentration by weight of the dry paulownin or extract of *Paulownia* wood by the concentration by weight of the additional anti-inflammatory compound) of about 0.001 to about 100, preferably about 0.01 to about 10, more preferably about 0.25 to about 2.

In certain preferred embodiments, the compositions of the present invention are skin care compositions that comprise paulownin or an extract of *Paulownia* wood and at least one additional agent improving the signs of aging. Examples of suitable additional agents improving the signs of aging include, but are not limited to, tropoelastin promoters, collagen promoters, retinoids, hyaluronic acid, dimethylaminoethanol, N,N,N',N'-Tetrakis(2-hydroxypropyl)ethylenediamine, alpha hydrox acids, polyhydroxyacids, and combinations of two or more thereof.

"Tropoelastin promoter," as used herein, refers to a class of compounds that possess the biological activity of enhancing the production of tropoelastin. Tropoelastin promoters, according to the present invention, include all natural or synthetic compounds that are capable of enhancing the production of tropoelastin in the human body.

Suitable tropoelastin promoters may be determined, for example, using the TROPOELASTIN PROMOTER ASSAY. The TROPOELASTIN PROMOTER ASSAY is performed as follows. Rat cardiac myoblasts H9C2 (which may be purchased, for example from ATCC of Manassas, Va.) are used. Cultures are maintained in Dulbecco's modified Eagle's medium (DMEM, Invitrogen Life Technologies, Carlsbad, Calif.) supplemented with 10% fetal bovine serum, 2 mM glutamine, 100 units/ml penicillin, and 50 ug/ml streptomycin (Invitrogen LifeTechnologies, Carlsbad, Calif.). Cell cultures are transiently transfected with the elastin promoter-luciferase reporter construct (Elp2.2, a 2.2 kb elastin promoter fragment from nt −2267 to nt +2, driving the firefly luciferase gene, which may be obtained from Promega, Madison Wis.). DNA is prepared by Qiagen Maxi columns (Qiagen Valencia, Calif.). In all transfections, a construct with the thymidine kinase promoter and the *Renilla* luciferase reporter gene (pRL-TK, Promega, Madison Wis.) is included as an internal control. Typically, cells grown in 48-well plates are transfected with 0.45 ug total DNA per well using Lipofectamine 2000 (Invitrogen Life Technologies, Carlsbad, Calif.). One day after transfection, cells are treated with agents at indicated concentrations for approximately 24 hours before they are lysed for luciferase assays, using Dual-Luciferase Reporter System from Promega (Madison, Wis.), following manufacturer's protocol. The firefly luciferase activity is measured first (representing elastin promoter activity), followed by the *renilla* luciferase (internal control), using luminometer LMAX, from Molecular Devices (Sunnyvale, Calif.). The ratio of these two luciferase activities (RLU) is used to evaluate the Tropoelastin Promoter Activity. The tropoelastin promoter preferably has a Tropoelastin Promoter Activity of at least 1.1, preferably at least 1.25, more preferably at least 1.3, and most preferably at least 1.5, at least one concentration in the range of 0.5 micrograms/milliliter to 2.5 milligrams per milliliter (on an actives basis), and preferably at least one concentration in the range of 1.0 micrograms/milliliter to 2.5 milligrams per milliliter (on an actives basis).

Examples of suitable tropoelastin promoters include, but are not limited to, blackberry extracts, *cotinus* extracts, fever-

few extracts, extracts of *Phyllanthus niruri* and bimetal complexes having copper and/or zinc constituents. The bimetal complex having copper and/or zinc constituents may be, for example, copper-zinc citrate, copper-zinc oxalate, copper-zinc tartarate, copper-zinc malate, copper-zinc succinate, copper-zinc malonate, copper-zinc maleate, copper-zinc aspartate, copper-zinc glutamate, copper-zinc glutarate, copper-zinc fumarate, copper-zinc glucarate, copperzinc polyacrylic acid, copper-zinc adipate, copper-zinc pimelate, copper-zinc suberate, copper-zinc azealate, copper-zinc sebacate, copper-zinc dodecanoate, or combinations thereof. In a preferred embodiment, the tropoelastin promoter is selected from blackberry extracts, cotinus extracts, feverfew extracts, and combinations thereof. In a particularly preferred embodiment, the tropoelastin promoter is selected from blackberry extracts, feverfew extracts, and combinations thereof.

By "*cotinus* extract," it is meant an extract of the leaves of "*Cotinus coggygria,*" such as a water extract thereof, available from Bilkokoop of Sofia, Bulgaria.

By "blackberry extract," it is meant a blend of compounds isolated from the plant of the genus *Rubus*, and preferably *Rubus fruticosus*. In one embodiment, the compounds are isolated from the flowers of the plant. In a further embodiment, the compounds are isolated from dried flowers of the plant. Such compounds may be isolated from one or more part of the plant (e.g., the whole plant, flower, seed, root, rhizome, stem, fruit and/or leaf of the plant). In a preferred embodiment, the blackberry extract is a blackberry leaf extract.

The extraction process may include by physically removing a piece of such plant, and, for example, grinding it. Further extraction of suitable compounds may also be isolated from the plant by using extraction procedures well known in the art (e.g., the use of organic solvents such as lower C1-C8 alcohols, C1-C8 alkyl polyols, C1-C8 alkyl ketones, C1-C8 alkyl ethers, acetic acid C1-C8 alkyl esters, and chloroform, and/or inorganic solvents such as water, inorganic acids such as hydrochloric acid, and inorganic bases such as sodium hydroxide).

For example, a blackberry leaf extract may be prepared by an extraction with water, alcohols such as ethanol or combination thereof as the solvent. However, an extract produced with a solvent including both ethanol and water is preferred. The blackberry leaves are preferably dried prior to extraction. It is also preferable to use only the leaves of the blackberry plant for the extraction and not also other plant parts such as the fruit (berries) of the blackberry or its branches and roots. In one embodiment, the extraction process for the production of a blackberry leaf extract comprises the following steps: a) addition to blackberry leaves of an solvent containing an alcohol selected from the group consisting of methanol, ethanol, npropanol, isopropanol, b) Extraction of the blackberry leaves with the solvent for up to 72 hours.

Detailed procedures for preparing a suitable blackberry leaf extract are disclosed in US Patent Application Publication No. 2008/0095719, the disclosure of which is incorporated herein in its entirety.

One particularly suitable blackberry extract is produced by extracting the leaves of *Rubus fruticosus* with a mixture of water and ethanol compounded to an activity of about 5% to about 10%, with a maltodextrin matrix, commercially available from Symrise Inc. of Teterboro, N.J., and is sold under the name "SymMatrix."

Extracts of "*Phyllanthus niruri*" may be harvested and used as the whole plant, or optionally one or more parts of the plant (e.g., flower, seed, root, rhizome, stem, fruit and/or leaf of the plant) may be used. The *Phyllanthus niruri* plant or parts thereof may be finely divided, such as by grinding or milling, to a powder. A suitable milled form of *Phyllanthus niruri* is commercially available from Raintree Nutrition, Inc., of Carson City, Nev. Preferably, a low molecular weight fraction of *Phyllanthus niruri* is used, for instance a fraction of *Phyllanthus niruri* substantially free of molecular species having a molecular weight of greater than about 100,000 daltons. Preferably, such low molecular weight fraction is water extractable from the *Phyllanthus niruri* plant.

Compositions of the present invention may include a cosmetically effective amount of one or more tropoelastin promoters such as those described above. The compositions preferably include, on an active basis, from about 0.1% to about 10% of the tropoelastin promoters, more preferably from about 0.5% to about 5% of tropoelastin promoters, and most preferably from about 0.5% to about 2% of the tropoelastin promoters.

Compositions of the present invention include one or more tropoelastin cross-linkers. By "tropoelastin crosslinker," it is meant a class of compounds that possess the biological activity of enhancing the enzymatically-based cross-linking of elastin precursors such as tropelastin, fibrilin and the like to one another or onto other elastin precursors or onto existing elastic fibers.

In one embodiment, the tropoelastin crosslinker is suitable to promote the activity of an isoform of lysyl oxidase (such as LOXL, lysyl-oxidase like isoform) as described in published patent application, GB2402676 of Colectica, which is incorporated herein by reference in its entirety.

Particularly suitable examples of tropoelastin cross-linkers include natural or synthetic compounds, such as, but not limited to, dill extract, currant extract, cardamom extract, black radish extract, box holly extract, *Asafoetida* extracts (e.g., gum), ethyl hexenoate, methyl butyrate, and ethyl decadienoate. One particularly suitable tropoelastin cross-linker is dill extract.

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In one embodiment, the tropoelastin crosslinker is suitable to promote the activity of an isoform of lysyl oxidase (such as LOXL, lysyl-oxidase like isoform) as described in published patent application, GB2402676 of Colectica, which is incorporated herein by reference in its entirety.

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As used herein, "dill extract" means an extract of a plant of the genus *Peucedanum*, and preferably *Peucedanum graveolens*. The extract may be one of the whole plant, flower, seed, root, rhizome, stem, fruit and/or leaf of the plant, such as may be prepared by grinding or chemical extraction. In a preferred embodiment, the dill extract is an extract of the fruit of dill, preferably of *Peucedanum graveolens*.

Such compounds may also be isolated from the plant by using extraction procedures well known in the art, e.g., the use of organic solvents such as lower C_1-C_8 alcohols, C_1-C_8 alkyl polyols, C_1-C_8 alkyl ketones, C_1-C_8 alkyl ethers, acetic acid C_1-C_8 alkyl esters, and chloroform, and/or inorganic solvents such as water, inorganic acids such as hydrochloric acid, and inorganic bases such as sodium hydroxide.

One particularly suitable dill extract is a "dill fruit," 5%-10% in water, commercially available from BASF of Parsippany, N.J., as "Lys'lastin."

In one embodiment, the composition preferably includes, on an active basis, from about 0.1% to about 10% by weight of tropoelastin crosslinker, more preferably from about 0.5% to about 5% by weight of tropoelastin crosslinker, and most preferably from about 0.5% to about 2% by weight of tropoelastin crosslinker.

"Collagen promoter" as used herein refers to compounds that possess the biological activity of enhancing the production of collagen. "Non-retinoid collagen promoters," according to the present invention, include all natural or synthetic compounds that are not retinoids, or derived from retinoids, and are capable of enhancing the production of collagen in the human body.

Suitable collagen promoters may be determined, for example, using the COLLAGEN PROMOTER ASSAY. The COLLAGEN PROMOTER ASSAY is performed as follows. Rat cardiac myoblasts H9C2, which may be purchased from ATCC (Manassas, Va.), are used. Cultures are maintained in Dulbecco's modified Eagle's medium (DMEM, Invitrogen Life Technologies, Carlsbad, Calif.) supplemented with 10% fetal bovine serum, 2 mM glutamine, 100 units/ml penicillin, and 50 μg/ml streptomycin (Invitrogen life technologies, Carlsbad, Calif.). Cell cultures are transiently transfected with the Collagen1A promoter-luciferase reporter construct, driving the firefly luciferase gene, which may obtained for example from PREMAS Biotech Pvt. Ltd (Haryana, India). In all transfections, a construct with the thymidine kinase promoter and the *Renilla* luciferase reporter gene (pRL-TK, Promega, Madison, Wis.) is included as an internal control. Cells grown in 48-well plates are transfected with 0.45 μg total DNA per well using Lipofectamine 2000 (Invitrogen life technologies, Carlsbad, Calif.). One day after transfection, cells are treated with agents at the indicated concentrations for approximately 24 hours before they are lysed for luciferase assays, using Dual-Luciferase Reporter System from Promega (Madison, Wis.), following manufacturer's protocol. The firefly luciferase activity is measured first (representing collagen promoter activity), followed by the *renilla* luciferase (internal control), using luminometer LMAX, from Molecular Devices (Sunnyvale, Calif.). The ratio of these two luciferase activities (RLU) is used to evaluate the activity of each promoter.

The suitable collagen promoter preferably has a Collagen Promoter Activity of at least 1.2, preferably at least 1.25, more preferably at least 1.3; at least one concentration in the range of 0.5 micrograms/milliliter to 2.5 milligrams per milliliter (on an actives basis), preferably at least one concentration in the range of 1.0 micrograms/milliliter to 2.5 milligrams per milliliter (on an actives basis).

Examples of suitable non-retinoid collagen promoters include, but are not limited to the following: extracts of feverfew (*Tanacetum parthenium*), extracts of *Centella asiatica*, extracts of *Siegesbeckia orientalis*; extracts of soy; collagen promoting peptides; ursolic acid; and asiaticoside. *Centella asiatica*, also known as *Violette marronne* on Reunion Island, Gotu Kola or Indian pennywort in India, *Centella repanda* in North America, and Talapetraka in Madagascar, is a polymorphous herb and belongs to the family of Umbelliferae (Apiaceae), particularly to the Hydrocotyle subfamily. It grows wild throughout the tropics and prefers moist and shady regions at an altitude of about 600 to 1200 meters above sea level. *Centella asiatica* has three varieties: *Typica, Abyssinica*, and *Floridana*. The herb is known and used for its healing, sedative, analgesic, antidepressant, antiviral and antimicrobial properties. The biological activity of the herb appears to be due to the presence of triterpene molecules in the herb. A suitable extract of *Centella asiatica* is available as TECA from Bayer Consumer HealthCare of Basel, Switzerland.

By "extracts of *Siegesbeckia orientalis,*" is meant any of various extracts of the plant *Siegesbeckia orientalis*, including Darutoside available from Sederma (Croda International Group of Edison, N.J.).

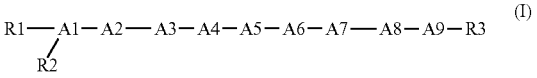
Suitable collagen-promoting peptides include the following:

(1) matrikine peptides, (i.e., a peptide derived from the degradation of extracellular matrix proteins—collagen, elastin, or proteoglycan) including palmitoyl pentapeptides, in particular Pal-Lys-Thr-Thr-Lys-Ser-OH, available as MATRIXYL from Sederma (Croda International Group of Edison, N.J.);

(2) GHK copper peptide available as PROCYTE from Photomedex of Montgomeryville, Pa.;

(3) Palmitoyl GHK peptide available as Biopoeptide CL from Sederma (Croda International Group of Edison, N.J.);

(4) Peptides VFTRN, TRNDKL disclosed in EP1775306 B1, and described below in the following formulas I, II and III:



wherein formula I contains at least six amino acid residues; and:

A1 is Val, Ala, Leu, Met or absent;

A2 is Arg, Lys or absent;

A3 is Phe, Tyr or absent;

A4 is Thr, Ser, Ala, or Lys;

A5 is Arg or Lys;

A6 is Asn, Asp, Gly, or Gln;

A7 is Asp, Asn, Glu, or absent;

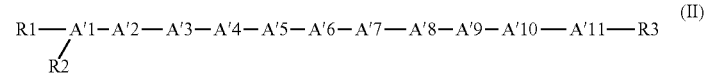
A8 is Lys, Arg or absent; and

A9 is Leu, Met, Val, Ile, Phe or absent;

provided that A3 may only be absent if A2 is absent, A2 may only be absent if A1 is absent, A7 may be absent only if A8 is absent, and A8 may only be absent if A9 is absent;

each R1 and R2, independently, is H, C1-12 alkyl, C7-10 phenylalkyl, or C(=O)E1, where E 1 is C1-12 alkyl, C3-14 alkenyl, C3-14 alkynyl, phenyl, 3,4-dihydroxyphenylalkyl, naphthyl, or C7-10 phenylalkyl; provided that when either R1 or R2 is C(=O)E1, the other must be H; and R3 is OH, NH2, C1-12 alkoxy, C7-10 phenylalkoxy, C11-14 naphthylalkoxy, C1-12 alkylamino, C7-10 phenylalkylamino, or C11-14 naphthylalkylamino;

or a cosmetically acceptable salt thereof.



wherein formula II contains at least six amino acid residues; and:

A'1 is Val, Ala, Leu or Met;

A'2 is Arg or Lys;

A'3 is Phe or Tyr;

A'4 is Leu, Met, Val, Ile or Phe;

A'5 is His, Tyr or Phe;

A'6 is Ser, Thr, Ala or Lys;

A'7 is Tyr or Phe;

A'8 is Asp, Asn or Glu;

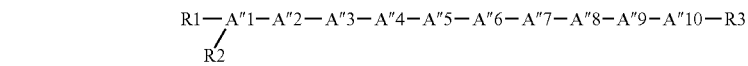
A'9 is Leu, Met, Val, Ile or Phe;

A'10 is Lys or Arg;

A'11 is Asn, Asp, Gly or Gln; and

R1, R2, and R3, are the same as those defined in formula I.

(III)



wherein formula III contains at least six amino acid residues; and:

A"1 is Cys or Ser;

A"2 is His, Tyr or Phe;

A"3 is Lys or Arg;

A"4 is Leu, Met, Val, Ile or Phe;

A"5 is Leu, Met, Val, Ile or Phe;

A"6 is His, Tyr or Phe;

A"7 is Asn, Asp, Gly or Gln;

A"8 is Val, Ala, Leu or Met;

A"9 is Asn, Asp, Gly or Gln;

A"10 is Lys or Arg; and

R1, R2, and R3, are the same as those defined in formula I.

(5) Biomimetic tetrapeptides, such as those available as Chronoline Tri Peptide from Unipex of Québec, Canada; and

(6) Palmitoyl tri-peptide, available as Syn-Coll from DSM of Basel, Switzerland. Ursolic acid is also known as pentacyclic triterpene acid, Prunol, Malol, Urson, beta-ursolic acid and 3-Beta-Hydroxy-Urs-12-En-28-Oic Acid, It is commercially available for example from Sigma-Aldrich of St. Louis, Mo.

Asiaticoside, also known chemically as: [6-[[3,4-dihydroxy-6-(hydroxymethyl)-5-(3,4,5-trihydroxy-6-methyloxan-2-yl)oxyoxan-2-yl]oxymethyl]-3,4,5-trihydroxyoxan-2-yl]10,11-dihydroxy-9-(hydroxymethyl)-1,2,6a,6b,9,12a-hexamethyl-2,3,4,5,6,6a,7,8,8a,10,11,12,13,14b-tetradecahydro-1H-picene-4a-carboxylate) is commercially available for example from Bayer Santé Familiale Division Serdex, 69, Boulevard Victor Hugo 93400 SAINT-OUEN France.

Compositions of the present invention may include a cosmetically effective amount of one or more collagen promoters. The compositions preferably include, on an active basis, from about 0.1% to about 10% of the collagen promoters, more preferably from about 0.5% to about 5% of collagen promoters, and most preferably from about 0.5% to about 2% of the collagen promoters.

A variety of other materials may also be present in the compositions of the present invention. In certain preferred embodiments, the composition is a skin care composition comprising one or more materials selected from the group consisting of: surfactants, chelating agents, emollients, humectants, conditioners, preservatives, opacifiers, fragrances and the like.

What is meant by an emollient is a compound that helps to maintain the soft, smooth, and pliable appearance of the skin (e.g., by remaining on the skin surface or in the stratum corneum to act as a lubricant). Examples of suitable emollients include those found in Chapter 35, pages 399-415 (Skin Feel Agents, by G Zocchi) in Handbook of Cosmetic Science and Technology (edited by A. Barel, M. Paye and H. Maibach, Published in 2001 by Marcel Dekker, Inc New York, N.Y.), and include, but are not limited to, petrolatum, hexyldecyl stearate and plant, nut, and vegetable oils such as macadamia nut oil, rice bran oil, grape seed oil, palm oil, primrose oil, hydrogenates peanut oil, and avocado oil.

What is meant by a humectant is a compound intended to increase the water content of the top layers of skin (e.g., hygroscopic compounds). Examples of suitable humectants include those found in Chapter 35, pages 399-415 (Skin Feel Agents, by G Zocchi) in Handbook of Cosmetic Science and Technology (edited by A. Barel, M. Paye and H. Maibach, Published in 2001 by Marcel Dekker, Inc New York, N.Y.) and include, but are not limited to, glycerin, sorbitol or trehalose (e.g., α,α-trehalose, β,β-trehalose, α,β-trehalose) or a salt or ester thereof (e.g., trehalose 6-phosphate).

What is meant by a surfactant is a surface-active agent intended to cleanse or emulsify. Examples of suitable surfactants include those found in Chapter 37, pages 431-450 (Classification of surfactants, by L. Oldenhove de Guertechin) in Handbook of Cosmetic Science and Technology (edited by A. Barel, M. Paye and H. Maibach, Published in 2001 by Marcel Dekker, Inc New York, N.Y.) and include, but are not limited to anionic surfactants such as sulfates, cationic surfactants such as betaines, amphoteric surfactants such as sodium coco glycinate, noionic surfactants such as alkyl polygucosides.

Examples of suitable chelating agents include those which are capable of protecting and preserving the compositions of this invention. Preferably, the chelating agent is ethylenediamine tetracetic acid ("EDTA"), and more preferably is tetrasodium EDTA, available commercially from Dow Chemical Company of Midland, Mich. under the tradename, "Versene 100XL."

Suitable preservatives include, for example, parabens, quaternary ammonium species, phenoxyethanol, benzoates, DMDM hydantoin, organic acids and are present in the composition in an amount, based upon the total weight of the composition, from about 0 to about 1 percent or from about 0.05 percent to about 0.5 percent.

Any of a variety of conditioners which impart additional attributes, such as gloss to the hair are suitable for use in this invention. Examples include, but are not limited to, volatile silicone conditioning agent having an atmospheric pressure boiling point less than about 220° C. Examples of suitable volatile silicones nonexclusively include polydimethylsiloxane, polydimethylcyclosiloxane, hexamethyldisiloxane, cyclomethicone fluids such as polydimethylcyclosiloxane available commercially from Dow Corning Corporation of Midland, Mich. under the tradename, "DC-345" and mixtures thereof, and preferably include cyclomethicone fluids. Other suitable conditioners include cationic polymers, including polyquarterniums, cationic guar, and the like.

Any of a variety of commercially available pearlescent or opacifying agents are suitable for use in this invention. Examples of suitable pearlescent or opacifying agents include, but are not limited to, mono or diesters of (a) fatty acids having from about 16 to about 22 carbon atoms and (b) either ethylene or propylene glycol; mono or diesters of (a) fatty acids having from about 16 to about 22 carbon atoms (b) a polyalkylene glycol of the formula: $HO-(JO)_a$—H, wherein J is an alkylene group having from about 2 to about 3 carbon

atoms; and a is 2 or 3; fatty alcohols containing from about 16 to about 22 carbon atoms; fatty esters of the formula: $KCOOCH_2L$, wherein K and L independently contain from about 15 to about 21 carbon atoms; inorganic solids insoluble in the shampoo composition, and mixtures thereof.

Any fragrance compositions suitable for use on skin and desirable for a skin care composition may be used in accord with the present invention.

In certain preferred embodiments, the present invention is in the form of a substrate comprising a composition of the present invention. Any suitable substrate may be used in the present invention. Examples of suitable substrates and substrate materials are disclosed, for example, in U.S. Published Application Nos. 2005/0226834 and 2009/0241242 which are incorporated herein by reference in their entirety.

In certain preferred embodiments, the substrate is a wipe or a glove. Preferably, such embodiments comprise a water-insoluble substrate as such is defined in the cited references above.

The present invention further comprises methods of treating cellulite by applying to skin in need of cellulite treatment paulownin or an extract of *Paulownia* wood, as described in the embodiments above.

The present invention may comprise application to any skin in need of treatment on the body. For example, application may be made to any one or more of the skin of the abdomen, thighs or buttocks.

The present invention further comprises methods of preventing cellulite by applying to skin (not necessarily in need of cellulite treatment, as defined in this specification) of the abdomen, thighs, and/or buttocks, paulownin or an extract of *Paulownia* wood, as described above.

Preferably, the methods of the present invention comprise applying an anti-cellulite effective amount paulownin or an extract of *Paulownia* wood to the skin, preferably also a safe and effective amount. In certain preferred embodiments, the methods comprise applying from greater than zero to about 20% paulownin or an extract of *Paulownia* wood to the skin in need of treatment. In certain other preferred embodiments, the methods comprise applying from greater than zero to about 20% paulownin or an extract of *Paulownia* wood. In certain other preferred embodiments, the compositions comprise from about 0.01 to about 10%, from about 0.1 to about 5%, from about 0.1 to about 1%, from about 0.5 to about 5%, or from about 0.5 to about 2% paulownin or an extract of *Paulownia* wood.

Any suitable method of applying the composition to the skin in need may be used in accord with the present invention. For example, the composition may be applied directly from a package to the skin in need, by hand to the skin in need, or may be transferred from a substrate such as a wipe. In other embodiments, the composition may be applied via a dropper, tube, roller, spray, patch or added to a bath or otherwise to water to be applied to the skin, and the like.

In certain embodiments, the methods of the present invention further comprise the step of leaving the composition in contact with the skin for period of time. For example, in certain preferred embodiments after application, the composition is left in contact with the skin for a period of about 15 minutes or greater. In certain more preferred embodiments, the composition is left in contact with the skin for about 20 minutes or greater, more preferably about 1 hour or greater

In certain embodiments, the method of the present invention comprises a regimen comprising applying composition to skin multiple times over a selected period of time. For example, in certain embodiments, the present invention provides a method of treating cellulite comprising applying to skin in need of cellulite treatment, a composition comprising paulownin or an extract of *Paulownia* wood once or twice daily for at least 12 weeks, preferably at least 8 weeks and more preferably for at least 2 weeks.

The present invention further comprises methods of reducing adipogenesis and/or orange peel effect in skin comprising the step of applying to skin in need of said reducing, paulownin or an extract of *Paulownia* wood as described above.

The compositions of the present invention may be suitable for a variety of other uses. For example, compositions of the present invention may be useful for cleansing and/or moisturizing dry skin, treating signs of aging and/or for treating inflammation, including post-inflammatory hyperpigmentation and reducing the appearance of stretch marks. In certain other embodiments, compositions of the present invention may be applied simultaneously with or within several hours of a mechanical or physical exfoliant such as a microdermabrasion treatment, or with a chemical exfoliant or keratolytic agent such as salicylic acid.

EXAMPLES

The anti-adipogenic activity of extract of *Paulownia tomentosa* wood was evaluated using the ADIPOGENESIS INHIBITION TEST as follows.

Reagent materials included the following:

1) Fetal bovine serum ("FBS"), obtained from ATCG, Marne-la-Vallée France (ref #04-007). An alternative supplier is Dutscher SA of Brumath France (ref#500105A).

2) Dulbecco's Modified Eagle Medium/Nutrient Mixture F 12 mixed 1:1 without phenol red and HEPES. ("DMEM/F12"), available from Invitrogen Life Technologies Leek, Nev., Ref 21041-025)

3) 4-(2-hydroxyethyl)-1-piperazineethanesulfonic acid "HEPES" 1M solution, available from Invitrogen, Ref 15630-O56)

4) Calcium Pantothenate, available from Sigma Aldrich St Louis, Mo., C8731-25G) (dissolved in water, 17 mM)

5) Biotin 99%, available from Sigma Aldrich, B4639-16) (dissolved in water with 4 drops of 1M NaOH, 16 mM)

6) Dexamethasone 97%, available from SIGMA D4902-100 mg, dissolved in ethanol)

7) 3-Isobutyl 1-methylxanthine ("IBMX"), available from Sigma Aldrich, 1-7018). Dissolved in water and boiled at 80° C. for 5 min)

8) Rosiglitazone, available from Cayman Chemical Company, Ann Arbor, Mich.) Ref 71740, 10 mg, dissolved in DMSO

9) Human insulin solution 10 mg/ml in 25 mM HEPES pH 8.1, available from SIGMA 19278-5 ml), and

10) Penicillin, Streptomycin, Fungizone solution ("PSF"), available from Invitrogen Life Technologies 15240-062)

The ADIPOGENESIS INHIBITION TEST was performed as follows. A growth medium for human preadipocytes ("PM-1") was prepared by mixing reagents 1, 2, 3, and 10 above, so as to provide the following concentrations: HEPES 15 mM, FBS 10%, PSF 1%, with the remainder DMEM/F12. Four-well plates were seeded with 1 ml of human preadipocytes at a density of 80000 cells in suspension in PM-1. The cells were confluent within one week.

The extract of *Paulownia tomentosa* wood was prepared in the following manner: *Paulownia tomentosa* wood powder was obtained from Kurosawa Kiri Wood Supply Shop, Kitakata-city, Japan. Ten grams (10 g) of dry wood powder

was suspended in 250 mL of reagent grade ethanol and stirred at room temperature for 72 h. The resulting suspension was filtered and the filtrate dried under low pressure using rotary evaporator at 30 deg C. Dry crude extract was obtained at 3.5% yield (350 mg). The crude extract was dissolved in methanol at a concentration of 1% and was treated with active carbon (700 mg) for 5 min at room temperature. Suspension filtered through 0.45 micron filter paper. The filtrate was dried to get a visibly lighter color material, 210 mg (yields 60% from crude extract.

A medium for inducing differentiation in human preadipocytes ("PM-2") was prepared by mixing reagents 1 through 10 above, so as to provide the following concentrations: FBS 3%, HEPES 15 mM, IBMX 0.25 mM, PSF 1%, Ca Pantothenate 17 μM, Biotin 33 μM, Insulin 100 nM, Dexamethasone 1 μM, Rosiglitazone 10 μM, with the remainder DMEM/F12 mix. One week after plating (or alternatively, when confluent), PM-2 and the test material were added. A "negative control" was prepared in a similar manner, except that the extract of *Paulownia tomentosa* wood was excluded (only PM-2 was added to the cells).

A "positive" or "undifferentiated" control was also prepared. For the undifferentiated control, a maintenance medium "AM-1" was prepared by mixing reagents 1-6, 9-10 above, so as to provide the following concentrations: HEPES 15 mM, FBS 3%, PSF 1%, Ca Pantothenate 17 μM, Biotin 33 μM, Insulin 100 nM, Dexamethasone 1 μM, the remainder DMEM/F12 mix. Tumor necrosis Factor (TNFα, Sigma-Aldrich) was also evaluated as a secondary positive control and is diluted in DM-2 medium. The incubation was performed for 8 days.

After the 8 day incubation, cell cytotoxicity was evaluated by using MTT colorimetric assay which measures the reduction of a yellow Methylthiazolyldiphenyl-tetrazolium bromide (MTT) into an insoluble purple product by the mitochondria of viable cells. The cells were washed and incubated with fresh DMEM/F12 medium containing 0.5 mg/ml of MTT at 37° C. for 3 hours. Medium was removed carefully and 1 ml of isopropanol is added. Using a plate reader, such as ENVISION 21030020, available from Perkin Elmer Courtaboeuf France, absorbance at 590 nm was read. The amount of purple color produced is directly proportional to the number of viable cells. The % viability of the cells for the test samples was independently greater than 80% of the undifferentiated and differentiated controls, confirming high cell viability.

In order to label the intracellular lipids present in culture, supernatants were removed and cells were washed with 1 ml of phosphate buffer saline. Then intracellular lipid droplets were labeled with 1 ml of PBS containing 10 μl Adipored (a fluorescent dye supplied by Lonza Group of Basel, Switzerland).

After 15 min of incubation at room temperature, the plate was directly read using the above plate reader, set to an excitation wavelength of 485 nm and to read emission wavelength of 572 nm). The fluorescent signal is proportional to the mass of lipid intracellular droplets.

Four (4) samples each of the undifferentiated control (medium only), differentiated control (medium+0.25 mM IBMX+Rosiglitazone), 0.25 ng/ml TNF, 2.5 ng/ml TNF, 25 ng/ml TNF, and each test sample were made and the fluorescence measured for each.

The fluorescence data is shown below, in Table 1.

TABLE 1

Percent Inhibition of Adipogenesis, Measured By Fluorimetry

	Fluorescence Count	Percent Inhibition (%)
Undifferentiated control	153,523	100 (positive control)
Differentiated control	1,610,000	0 (negative control)
TNF, 0.25 ng/ml	1,152,500	31.4
TNF, 2.5 ng/ml	286,966	90.8
TNF, 25 ng/ml	275,488	91.6
extract of *Paulownia tomentosa* wood, 0.1 μg/ml	1,657,500	−3.3
extract of *Paulownia tomentosa* wood, 1 μg/ml	1,044,262	38.8
extract of *Paulownia tomentosa* wood, 10 μg/ml	1,005,184	41.5
extract of *Paulownia tomentosa* wood, 100 μg/ml	686,410	63.4

Percent Inhibition was calculated using the formula below:

Percent Inhibition=100%*[(diff control−sample)/(diff. control−undifferentiated control)]

The results clearly show that extract of *Paulownia tomentosa* wood reduced the amount of intracellular lipid.

What is claimed is:

1. A method of treating cellulite in a subject in need thereof comprising topically applying to skin in need of cellulite treatment a composition comprising a cellulite treating effective amount of paulownin or a cellulite treating effective amount of an extract of *Paulownia* wood containing paulownin.

2. The method of claim **1**, wherein said composition further comprises a material selected from the group consisting of surfactants, chelating agents, emollients, humectants, conditioners, preservatives, opacifiers, fragrances, and combinations thereof.

3. The method of claim **1**, wherein said extract is a polar extract of *Paulownia tomentosa* wood.

4. The method of claim **3**, wherein said polar extract is extracted using one or more solvents comprising C_1-C_8 alcohols, C1-C8 glycols, water, or a combination thereof.

5. The method of claim **3**, wherein said polar extract is extracted using one or more solvents comprising ethanol, methanol, or a combination thereof.

6. The method of claim **3**, wherein said extract is extracted using a solvent having a dielectric constant of from about 4 to about 60 at 20° C.

7. The method of claim **1**, wherein said composition comprises from greater than zero to about 20% of paulownin or the extract of *Paulownia* wood.

8. The method of claim **1**, wherein said composition comprises from about 0.01 to about 5% of paulownin or the extract of *Paulownia* wood.

9. The method of claim **1**, wherein said composition is in the form of a solution, suspension, lotion, cream, serum, gel, stick, spray, ointment, liquid wash, soap bar, shampoo, hair conditioner, paste, foam, powder, mousse, shaving cream, hydrogel, or film-forming product.

10. The method of claim **1**, wherein the extract of *Paulownia* wood is an extract of *Paulownia tomentosa* wood.

11. The method of claim **1**, wherein said composition further comprises an additional anti-adipogenesis agent.

12. The method of claim **11**, wherein said additional anti-adipogenesis agent is a retinoid.

13. The method of claim 11, wherein said additional anti-adipogenesis agent is retinol.

14. The method of claim 1, wherein said composition further comprises a lipolytic agent is selected from the group consisting of caffeine, forskolin, yohimbin, and combinations of two or more thereof.

15. The method of claim 1, wherein said composition further comprises a retinoid and a lipolytic agent.

16. The method of claim 1, wherein said composition further comprises retinol and caffeine.

17. The method of claim 1, wherein said composition further comprises a lymphatic drainage agent.

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